This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

1. (Currently amended) A method of controlling the focus errors of a photolithographic exposure tool comprising the steps of:

a) making measurements of three dimensional feature changes in a photosensitive resist, wherein said measurements of three dimensional feature changes include a plurality of edge width measurements and said plurality of said edge width measurements correspond to changes in profile angle of said photosensitive resist;

b) generating a function which defines a relationship between said measurements of three dimensional features changes and a focus of said photolithographic exposure tool; and

c) computing from said function a best profile focus value wherein said best profile focus value is used for controlling the focus errors of said photolithographic exposure tool.

2. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 1 wherein said step a) comprises:

exposing a focus expose matrix wafer by varying exposure levels and focus conditions wherein said measurements of three dimensional feature changes include said plurality of edge width measurements versus focus data points for any given one of said exposure levels.

3. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 1, wherein said measurements of three dimensional feature changes of said step a) are stored by a computer.

4. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 2, wherein said plurality of edge width measurements versus focus data points are plotted for each of said exposure levels.

5. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 2 wherein said plurality of edge width measurements vs. focus data points are retained for a default exposure level.

6. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 5, wherein step b) comprises computing a derived equation which characterizes said plurality of edge width measurements vs. focus data points to define said function.

7. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 6, wherein a second derivative of said derived equation is solved to obtain said best profile focus value for said measurements of three dimensional feature changes where said second derivative is equal to zero.

8. (Original) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 7, wherein measurements of a specific three dimensional feature type are made across an exposure field on a production wafer.

9. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 8, wherein said measurements of said specific three dimensional feature type comprise edge width measurements.

10. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 9, wherein an average of said edge width measurements is calculated.

11. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 10, wherein said average of said edge width measurements is input to said function to derive a measured focus of said specific three dimensional feature type on said production wafer.

12. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 11, wherein a difference between said measured focus and said best profile focus value is fedback to said photolithographic exposure tool thereby controlling focus errors of said photolithographic exposure tool.

13. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 11, wherein a difference between said measured focus and an optimal product focus offset is fedback to said photolithographic exposure tool thereby controlling focus errors of said photolithographic exposure tool.

14. (Currently amended) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 6, wherein said derived equation which characterizes said plurality of edge width measurements vs. focus data point to define said function is a cubic of the form:

$$y = Ax^3 - Bx^2 + Cx + D,$$

where **y** is the edge width, **x** is the focus, **A**, **B**, **C** and **D** are empirically derived coefficients.

15. (Previously presented) The method of controlling the focus errors of a photolithographic exposure tool as claimed in Claim 7, wherein said second derivative solving step results in an equation:

$$6Ax + 2B = 0,$$

wherein the solution x representing said best profile focus value is governed by the equation:

$$x = -1/3*(B/A)$$

wherein A and B are empirically derived coefficients.

Claims 16- 21 (Canceled)

22. (Previously presented) A system for controlling the focus errors of a photolithographic exposure tool comprising:

a) means for measuring three dimensional feature changes by a plurality of edge width measurements in a photosensitive resist, wherein said edge width measurements correspond to changes in profile angle of said photosensitive resist;

b) function generation means for defining a relationship between said plurality of edge width measurements and focus of said photolithographic exposure tool;

c) means for determining from said function a best profile focus value wherein said best profile focus value is used to control the focus errors of said photolithographic exposure tool.

23. (Previously presented) The system as claimed in Claim 22 for controlling the focus errors of a photolithographic exposure tool, wherein said means for measuring said three dimensional feature changes further comprises:

means for obtaining measurements of said three-dimensional feature changes based on varying exposure levels and focus conditions wherein said measurements include said plurality of edge width measurements versus focus data points for any one of said exposure levels.

24. (Previously presented) The system as claimed in Claim 23 for controlling the focus of a photolithographic exposure tool wherein said function generation means includes

means for deriving an equation which characterizes said edge width versus focus data point for a default exposure level to thereby define said function.

25. (Original) The system as claimed in Claim 24 for controlling the focus errors of a photolithographic exposure tool further including means for solving a second derivative of said equation for said best profile focus value wherein said second derivative is equal to zero.

26. (Original) The system for controlling the focus errors of a photolithographic exposure tool as claimed in Claim 25 wherein an average of measurements of a three dimensional feature type on a production wafer is input to said function to derive a measured focus of said three dimensional feature type on said production wafer.

27. (Previously presented) The system for controlling the focus errors of a photolithographic exposure tool as claimed in Claim 26 wherein a difference between said measured focus and said best profile focus value is fedback to said photolithographic exposure tool thereby controlling focus errors of said photolithographic exposure tool.

28. (Currently amended) The system for controlling the focus errors of a photolithographic exposure tool as claimed in Claim 26 further comprising:

d) means for obtaining x/y tilt values including a y tilt value, θ_y, corresponding to a trigonometric relationship that relates a distance, $\mathbf{D}_y$ between measurement sites on said production wafer, an edge width derived focus, $\mathbf{F1}_y$ taken from the extreme lower position of an exposure field, and an edge width derived focus, $\mathbf{F2}_y$, taken from an extreme upper position of the exposure field;

e) means for obtaining said x/y tilt values including an x tilt value, θ_x, corresponding to a trigonometric relationship relating a distance $\mathbf{D}_x$ between measurement sites on said production wafer, and edge width derived focus $\mathbf{F1}_x$ taken from the extreme bottom

position of said exposure field, and an edge width derived focus, $\mathbf{F2_x}$ taken from the extreme top position of said exposure field;

f) means for correcting said photolithographic exposure tool with said tilt values, θ_x, θ_y.

29. (Previously presented) A computer program product comprising:

a computer usable medium having computer readable program code embodied therein executable by a computer for implementing focus error control of a photolithographic exposure tool, the computer readable program code in said computer program product comprising:

a) first computer readable program code for causing a computer to measure three dimensional profile changes of a feature in a photosensitive resist;

b) second computer readable program code for causing the computer to store said three dimensional profile changes, wherein said three dimensional profile changes correspond to changes in profile angle of said photosensitive resist;

c) third computer readable program code for causing the computer to generate a function which defines a relationship between said three dimensional profile changes and said focus of said photolithographic exposure tool;

d) fourth computer readable program code for causing the computer to calculate from said function a best profile focus value wherein said best profile focus value is used to control the focus errors of said photolithographic exposure tool.

30. (Previously presented) The computer program product as claimed in Claim 29 comprising a fifth computer readable program code for inputting to said function an average of measurements made on a specific three dimensional feature type across an

exposure field on a production wafer to derive a measured focus of said specific three dimensional feature type on said production wafer.

31. (Previously presented) The computer program product as claimed in Claim 30 comprising a sixth computer readable program code for computing a difference between said measured focus and said best profile focus value, then feeding back said difference to said photolithographic exposure tool wherein said focus errors of said photolithographic exposure tool are controlled.

32. (Previously presented) The computer program product as claimed in Claim 31 comprising:

seventh computer readable program code for causing the computer to calculate x-axis /y-axis tilt values from said measured focus, wherein said x-axis/y-axis tilt values are used to control tilt errors of said photolithographic exposure tool whereby an optimum x-axis/y-axis tilt offset is achieved.

Claim 33. (Canceled)